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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/817,135	04/01/2004	Valerie J. Marty	200309766	1502

22879 7590 08/06/2007

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EXAMINER	
CULBERT, ROBERTS P	
ART UNIT	**PAPER NUMBER**
1763	

MAIL DATE	DELIVERY MODE
08/06/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/817,135	MARTY ET AL.	
	Examiner	Art Unit	
	Roberts Culbert	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 July 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-54* is/are pending in the application.

4a) Of the above claim(s) *30-54* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant has argued that Whitesides et al. do not teach allowing the organic molecules to form an ordered pattern on the aligning substrate as recited in Claim 1. However the arguments are not persuasive because Whitesides et al. teach allowing the organic molecules to form an ordered pattern on the aligning substrate as broadly recited in claim 1, since allowing the solution to be conformally deposited on the ordered aligning substrate pattern as shown in Whitesides et al. reads broadly on the step as claimed.

Applicant's arguments filed 7/5/07 with respect to amended claim 23 have been fully considered, but are moot in view of the new grounds of rejection as recited below. (Hahn et al.)

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-5, 8-10, 12-14, 16 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 6,180,239 to Whitesides et al.

Regarding Claim 1, Whitesides et al. teach a method creating a patterned feature on a substrate comprising: preparing a solution of organic molecules having self-assembling properties (27), applying the solution to an aligning surface (20), allowing the organic molecules to form an ordered pattern on the aligning surface; (reads broadly on conformal coating shown) contacting the aligning surface with the substrate (30), and separating the aligning surface from the substrate, (Figure 1d) leaving patterns of the organic molecules on the substrate.

Regarding Claims 3 and 4, Whitesides et al. further teach preparing at least two different species of organic molecules to preferentially align to a plurality of features.

Regarding Claim 5, Whitesides et al. teach utilizing the ordered patterns of organic molecules as a mask.

Regarding Claims 8 and 9, Whitesides et al. teach the organic molecules have a molecular head group, tail and optionally a functional group.

Regarding Claim 10, Whitesides et al. teach an aromatic ring functionality (benzyl group) *See for example, C11, L55 of U.S. Patent 5,512,131 incorporated by reference.*

Regarding Claim 12, Whitesides teach the ordered patterns include substantially parallel lines (Figure 4a) Note that the size of the tail group inherently helps determine the lateral spacing between lines although not expressly recited.

Regarding Claim 13, Whitesides et al. teach preparing a solvent system having organic molecules therein, and wherein the organic molecules used to prepare the solvent system determine the lateral spacing.

Regarding Claim 14, Whitesides et al. teach choosing a functional group based on process requirements. (Col. 7, Lines 25-37)

Regarding Claim 16, Whitesides et al. teach the organic molecules contain a thiol group and the substrate a layer of gold. (*See Example 2, as well as U.S. Patent 5,512,131 incorporated by reference*)

Regarding Claim 20 Whitesides et al. teach the organic molecules are laterally spaced after they are applied as broadly claimed. Note that any plurality of molecules is "laterally spaced" as broadly claimed by applicant.

Regarding Claim 25, Whitesides et al. teach introducing additional organic molecule species to the surface, which preferentially align to the functional groups existing along defined patterns.

Regarding Claim 26, Whitesides et al. teach introducing additional organic molecule species having functional groups to the surface to cause certain molecules to preferentially align with according to functional groups along pre-defined patterns. (C13, L29-39)

Regarding Claims 27 and 28, Whitesides et al. teach etching the substrate.

Claims 1, 3-5, 8, 9, 12, 14, 16, 20 and 23-26 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent Application Publication 2003/0024632 to Hahn et al.

Regarding Claims 1 and 23, Hahn et al. teach a method creating a patterned feature on a substrate (*See entire disclosure and Figures 1-4*) comprising: preparing a solution of organic molecules having self-assembling properties, applying the solution to an aligning surface, allowing the organic molecules to form an ordered pattern on the aligning surface; contacting the aligning surface with the substrate, and separating the aligning surface from the substrate, leaving patterns of the organic molecules on the substrate.

Regarding Claims 3 and 4, Hahn et al. further teach preparing at least two different species of organic molecules (*3-MPTMS, trichlorosilane, trimethoxysilane*) to preferentially align to a plurality of features (*metal micropatterns i.e. gold, silver, copper*).

Regarding Claims 5 and 24, Hahn et al. do not expressly teach utilizing the ordered patterns of organic molecules as a mask. However the limitation reads on an intended use of the invention and does not further define the process over Hahn et al.

Regarding Claims 8 and 9, Hahn et al. teach the organic molecules have a molecular head group, tail and optionally a functional group.

Regarding Claim 12, Hahn teach the ordered patterns include substantially parallel lines. The step of determining reads broadly on a nebulous mental step.

Regarding Claim 14, Hahn et al. teach choosing a functional group based on process requirements. (*thiol functional group self-assembles on gold for example*)

Regarding Claim 16, Hahn et al. teach the organic molecules contain a thiol group and the substrate a layer of gold.

Regarding Claim 20 Hahn et al. teach the organic molecules are laterally spaced after they are applied. (See Figures 1-7)

Regarding Claim 25, Hahn et al. teach introducing additional organic molecule species to the surface, which preferentially align to the functional groups existing along defined patterns. (See Figures 2 and 3)

Regarding Claim 26, Hahn et al. teach introducing additional organic molecule species having functional groups to the surface to cause certain molecules to preferentially align with according to functional groups along pre-defined patterns. (See Figures 2 and 3)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 11 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,180,239 to Whitesides et al. in view of U.S. Patent 6,562,398 to Braach-Maksvytis et al.

Regarding Claims 11, 15 and 22, Whitesides teach phenyl groups on an alkyl hydrocarbon group and the like, (*See C11, L U.S. Patent 5,512,131 incorporated by reference*) but do not expressly teach biphenyl groups. However it is well known in the art of forming molecular structures having self-assembling properties to use biphenyl groups. For example, Braach-Maksvytis et al. (C7, L24-48) teach

the use of biphenyl groups. It would have been obvious to one of ordinary skill in the art at the time of invention to use biphenyl groups in order to impart structural stabilizing characteristics to the molecules as taught by Braach-Maksvytis et al.

Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,180,239 to Whitesides et al. in view of U.S. Patent 5,578,351 to Shashidhar et al.

Regarding Claims 17-19, Whitesides teach platinum and palladium may be used as the substrate, (*See C10, L57-60 of U.S. Patent 5,512,131 incorporated by reference*) but do not expressly teach isocyanate groups. However it is well known in the art of forming molecular structures having self-assembling properties to use isocyanate groups with platinum or palladium. For example, Shashidhar et al. (C4, L45-65) teach the use of isocyanate groups with compatible surfaces such as platinum and palladium. It would have been obvious to one of ordinary skill in the art at the time of invention to use isocyanate groups in order to impart liquid crystalline characteristics to the molecules as taught by Shashidhar et al. Note that the limitation reciting particles of palladium preferentially align to the surface along aligned molecules according to their functional groups reads on a palladium substrate having an isocyanate functional group since the same will be preferentially aligned and the substrate contains particles of palladium.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,180,239 to Whitesides et al. in view of U.S. Patent 6,465,054 to Effenberger.

Regarding Claim 21, Whitesides et al. teach the method of the invention substantially as claimed, but do not expressly teach solvating with an alkane solvent to control lateral spacing. However, the use of alkane solvent to increase spacing is well known in the art. For example, Effenberger teaches use of an alkane solvent to reduce the % coverage. (C6, L30-40). It would have been obvious to one of ordinary skill in the art at the time of invention to use an alkane solvent in order to increase spacing in the well-known manner.

Claims 10, 11, 15 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication 2003/0024632 to Hahn et al. in view of U.S. Patent 6,562,398 to Braach-Maksvytis et al.

Regarding Claims 10, 11, 15 and 22, Hahn et al. teach self-assembling groups but do not expressly teach biphenyl groups. However it is well known in the art of forming molecular structures having self-assembling properties to use biphenyl groups. For example, Braach-Maksvytis et al. (C7, L24-48) teach the use of biphenyl groups. It would have been obvious to one of ordinary skill in the art at the time of invention to use biphenyl groups in order to impart structural stabilizing characteristics to the molecules as taught by Braach-Maksvytis et al.

Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication 2003/0024632 to Hahn et al. in view of U.S. Patent 5,578,351 to Shashidhar et al.

Regarding Claims 17-19, Hahn et al teach metal transfer but do not expressly teach isocyanate groups. However it is well known in the art of forming molecular structures having self-assembling properties to use isocyanate groups with platinum or palladium. For example, Shashidhar et al. (C4, L45-65) teach the use of isocyanate groups with compatible surfaces such as platinum and palladium. It would have been obvious to one of ordinary skill in the art at the time of invention to use isocyanate groups in order to impart liquid crystalline characteristics to the molecules as taught by Shashidhar et al. Note that the limitation reciting particles of palladium preferentially align to the surface along aligned molecules according to their functional groups reads on a palladium substrate having an isocyanate functional group since the same will be preferentially aligned and the substrate contains particles of palladium.

Claims 21 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication 2003/0024632 to Hahn et al. in view of U.S. Patent 6,465,054 to Effenberger.

Regarding Claims 21 and 29, Hahn et al. teach the method of the invention substantially as claimed, but do not expressly teach solvating with an alkane solvent to control lateral spacing. However, the use of alkane solvent to increase spacing is well known in the art. For example, Effenberger teaches use of an alkane solvent to reduce the % coverage. (C6, L30-40). It would have been obvious to one of ordinary skill in the art at the time of invention to use an alkane solvent in order to increase spacing in the well-known manner.

Allowable Subject Matter

Claims 2 and 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roberts Culbert whose telephone number is (571) 272-1433. The examiner can normally be reached on Monday-Friday (8:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

R. Culbert
Examiner
Art Unit 1763